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ABSTRACT

PROBE, a search and retrieval program, was developed in 1970 at Indiana University to search the computer tape bases for the two ERIC publications, "Research in Education" (RIE) and "Current Index to Journals in Education" (CIJE). The ERIC tapes are received, converted, and combined at the University and implemented on the Wrubel Computing Center CDC 6600. This brief paper reviews the early experimental stages of the program and documents the project growth in staff and number of searches conducted in response to user requests. (A more detailed description of the PROBE program is ED 059 596.) (SJ)

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'P R O B E' COMPUTER SEARCH OF THE ERICTAPES

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'PROBE' COMPUTER SEARCH OF THE ERICTAPES

PROBE[1] was developed in 1970 at Indiana University to search the computer tape bases for the two ERIC indexes, Research in Education and Current Index to Journals in Education. The ERICTAPES are received, converted, and combined quarterly at the University and implemented on the Wrubel Computing Center CDC 6600.

The program has a variable-field format which gives it a broad range of capabilities. A search may be made through any of the following fields: author, title, descriptor (subject heading), identifier (additional non-thesaurus terms), abstract, accession number, sponsoring agency, institution, publication date, dissertation, and others. A combination of these fields may be used if necessary. Weighted searches may be made by adding a special control parameter to any descriptor or term and by specifying the desired weight and total.

The search is initiated by the use of a punched card deck to call the master program. Parameters are set, such as the total number of records to be printed, the number of abstracts for complete printouts, the range of fields to be searched, and the symbol to be used as a string delimiter.

Cards are keypunched for the individual searches with the capability of a variety of queries. Combinations of Boolean logic search strategies expressed in 'and', 'or', and 'not' are specified. For

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[1]PROBE is a batch-mode retrieval program of the ERICTAPES developed by Ronald Tschudi at Indiana University, Bloomington, Indiana.

example, if the user wishes information on mathematics education in elementary schools or middle schools but not in high school, the query may be structured as follows:

1. mathematics education
2. elementary schools
3. middle schools
4. secondary schools

Query - (1) and (2 or 3), but not (4)

Tschudi and Meredith described the program in more detail in a technical report published in 1972.[2]

During a period of experimentation from January to August, 1971, the ERIC Clearinghouse on Retrieval of Information and Evaluation on Reading at Bloomington, Indiana, offered their quarterly ERIC computer tapes for university use. A free batch-mode retrospective computer service was initiated for students and faculty of the Indiana University School of Education. With only one brief announcement in a library newsletter, an increasing number of doctoral students and faculty requested use of the free search service.

The Education Librarian acted as search negotiator to formulate the problem into ERIC descriptors and to structure the computer query. A member of the Graduate Library School Research Center screened the queries and forwarded them to the programmer, who did the keypunching and operated the tape searches at Indiana University's Wrubel Computing Center (WCC).

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[2]Tschudi, R. R., and Meredith, J. C., The "PROBE" Retrieval Program - A Description, ERIC, no. ED 059 596, Indiana University, Bloomington, Indiana, February 10, 1972, 15 pp.

No computer time was charged in this initial stage by the WCC. The approximate turnaround time was one week, with the searches submitted twice a week in batch-mode. The users were each allowed up to 20 descriptors and five queries. The printout consisted of any specified maximum number up to 100 citations per query with the complete abstracts. The remainder of the matches or hits were printed as accession numbers (ED numbers) only.

The users were mainly doctoral candidates, faculty members doing research or planning new curricula, and graduate students who needed information for term papers. During the eight month trial period, approximately 300 searches were completed. Of the trial searches, 122 were requested for educators by Phi Delta Kappa International Headquarters, a male education honorary whose international headquarters is located in Bloomington, Indiana. (They had previously conducted ERIC searches by means of an optical card system for educators who requested aid by mail. However, with the rapid growth of the size of the ERIC collection, the optical system was no longer adequate.) The majority of the searches were requested by Indiana University students and faculty. Most of the users were graduate students (142); the faculty requested 17 searches; administrators, 17 searches: and 4 were requested by others.

In this early period of experimentation a questionnaire was included with each printout for the user to indicate his reason for the search, his satisfaction or dissatisfaction, and other basic information. No follow-up was made at this time to encourage questionnaire returns; 26

of the questionnaires were returned. Some of the comments made were as follows:

> It is a fairly simple search to use and it is fast. It also enables one to be fairly certain that he has 'reached' all the various materials available through ERIC.
>
> If costs are kept to a minimum graduate students would make frequent use of the search. (This is in reply to a question asking if he would be willing to pay for this service.)
>
> All education students and teachers should be aware of these research services.
>
> The descriptors may be assigned too 'liberally' during the abstracting stage, consequently irrelevant material is included in the search.
>
> Turnaround time is rather large.
>
> Best resource yet in my study. Much better than DATRIX service received.
>
> Printout is discomforting and slow to read.
>
> This service should be encouraged. It is making a real contribution to the field.
>
> The necessity for batching does mean a time lag for certain pressing searches.

The great majority of the comments were favorable. Most of the dissatisfied users mentioned time lag, which was caused by making needed changes in the computer program, initiating the establishment of office routines, and some computer breakdowns.

Since the School of Education was receiving a standing order of the ERIC microfiche collection, the users had direct access to the full reports with microfiche readers and a reader-printer available. An electronic carrel contained a filmstrip-tape presentation describing the

ERIC system, which was developed by the Center for Research and Development in State Education Leadership, Teaching Research Division of the Oregon State System of Higher Education, Monmouth, Oregon. Later, a local set was developed at Indiana University and a tape was made to explain the PROBE computer search.

In September, 1971, with the support of interested persons at the University, the University Administration set up an account to support the PROBE expenses. The income from the newly established search charges was returned to this account. The WCC agreed not to charge computer time costs for Indiana University students and faculty at present; but a charge of $4.00 per search was established to help defray costs of a half-time graduate assistant, a part-time keypuncher, and a part-time programmer. Output from both RIE and CIJE was provided, since the tapes were still combined.

A publicity brochure was distributed to Indiana University faculty of Bloomington, of the six regional campuses, and of Indiana University-Purdue University at Indianapolis. Announcements were made at faculty meetings and in the campus newspaper and bulletins, and meetings were held with librarians to explain the computer service.

During the 12 month period from September, 1971, to August, 1972, the number of requests increased rapidly with approximately 1,778 searches being completed. Four hundred ninety-two requests were made through Phi Delta Kappa, 333 requests came from graduate students, 185 from the faculty, 16 from administrators, and 152 from others. The output parameters

were established at 100 abstracts, with provision for an additional 800 citations per search if needed. The programmer reversed file order on the tapes so the most recent abstracts were printed first.

As the number of users increased and many requests for service were made by patrons outside the University, other funding was sought for expansion. There was a need to employ a full-time librarian and secretary so that service could be extended to other Indiana libraries. Educators from universities, public schools, and special libraries were requesting searches.

In the spring of 1972 the Indiana State Library awarded the project a grant of $2,669 from funds provided by the Library Services and Construction Act (LSCA). These funds were used to publicize the service in all university, college, school, special, and public libraries in Indiana. The WCC continued to support the project by charging no computer costs for Indiana University users.

Since funds were needed for additional personnel and to support development and improvement of the program, a request was made again in the summer of 1972 for a larger LSCA grant from the Indiana State Library. An award of $24,616 was received in August, 1972, to enable the project to employ a full-time librarian, a secretary, and proceed with needed program improvements and evaluation. Information was needed in order to improve and expand service and to establish a reasonable pricing to allow the service to become self-supporting.

Following the expansion of the computer service to patrons throughout

Indiana, several changes were made. Since the contents of both RIE and CIJE files were growing quite large, the tapes were separated. Searches could be made of either set for a fee of $4.00 per search. The WCC was paid $2.00 for each off-campus search. A combination selective dissemination of information (SDI) search of both update tapes was offered quarterly for $5.00 per quarter. The programmer was able to improve the speed of the program. The printing format was changed to reflect the RIE standard format and two abstracts were printed on each page instead of one in order to decrease printing time. Searches were accepted by mail, telephone, teletype, and 'walk-in.' The number of descriptors was usually held to ten, with approximately five queries allowed. The output consisted of printing the first 100 abstracts, an additional 700 citations, and an unlimited number of accession numbers if there were additional hits. The turnaround time was shortened to two or three days, since batches were submitted to the computer three or four times a week.

In the six month period from September, 1972, to February, 1973, 878 searches were conducted. Phi Delta Kappa requested 361; graduate students, 191; faculty, 103; administrators, 44; undergraduates, 14; and other (school libraries, public libraries, etc.), 92.

As the project grew, studies of other retrieval systems were reviewed to determine the most appropriate evaluation design. It was noted that as economic restrictions have more and more affected the retrieval systems, the number of studies of the design and evaluation of systems to analyze and justify incurred costs has increased. It

is obviously desirable to design and operate a system that will achieve a balance between satisfactory performance and the least possible cost.

The planned evaluation of the program will include a study of the users' expressed needs and satisfaction and the cost-benefits of the computer program PROBE.

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